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GB 0452874

(58) Field of search
D1C
Selected US specifications from IPC sub-class D04B

(54) Knitting needle

(57) A knitting needle comprises a needle body which includes a needle shank (2) made of bamboo, wood, plastics or metal, and a separate front end member (1) made of ceramic and fixed to one end of the needle shank in alignment therewith. The member (1) may be pointed or hooked and is attached by screwing, adhesive or brazing. A projection (3) may be provided on either member (1) or (2) or a connector rod may engage bores in both members. The other end of the needle may have a second ceramic end member, a stitch stopper or a flexible cord.

FIG. 2

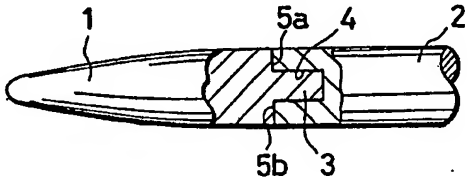

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FIG. 1

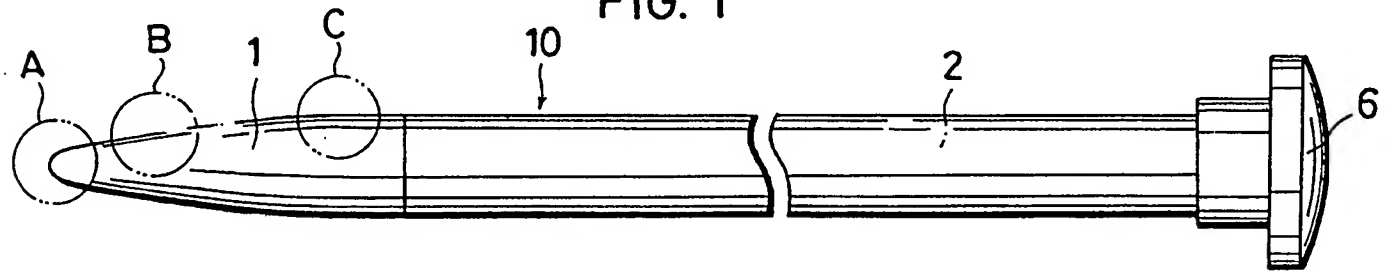


FIG. 2

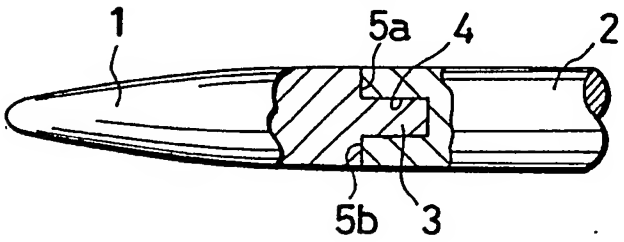


FIG. 3

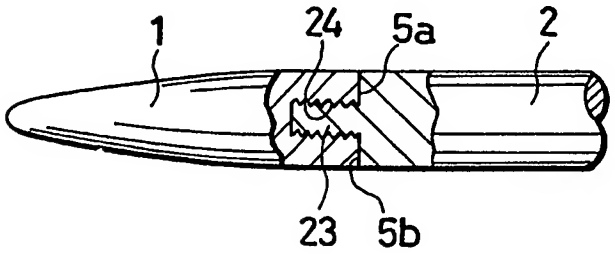


FIG. 4

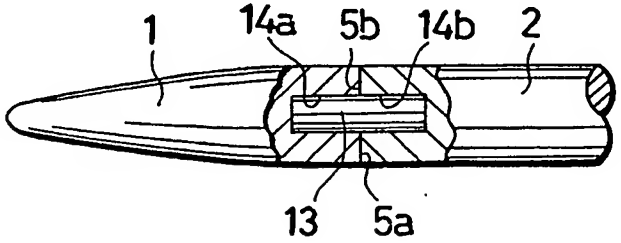
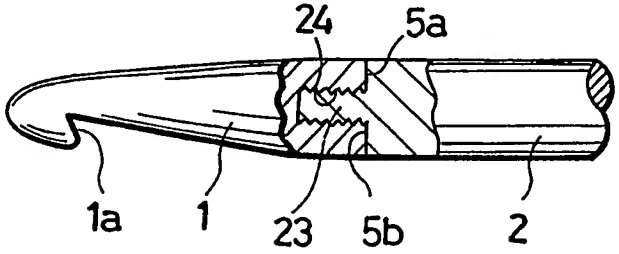


FIG. 5



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SPECIFICATION

Knitting needle

This invention relates to a knitting needle for manually knitting yarns and the like, and more particularly to such a knitting needle which is improved in surface slipperiness and abrasion resistance at its front or working end portion.

Generally, knitting needles are required to have good surface slipperiness, high abrasion resistance and light weight for facilitating a knitting operation and for providing a longer service life. Particularly, a front or working end portion of the knitting needle, which is functionally most important, needs to have good surface slipperiness and high abrasion resistance.

Conventional knitting needles in general use equally comprise an integral needle body made of bamboo, plastic or metal. Each of these materials, though providing advantages of its own, gives rise to the following limitations and disadvantages when used for such conventional knitting needles.

As is well known, bamboo stalks are hollow and have a limited wall thickness with a density or hardness of the wall gradually decreasing from the epidermis (outer surface) to the endodermis (inner surface). Thus, a bamboo knitting needle of a large diameter inevitably becomes softer on one side of its needle body than on the other side, which results in that a front or working end portion of the needle body is more liable to abrasion on the softer side.

Further, a bamboo knitting needle with a hooked working end has a problem that the hooked end is easily damaged upon overload.

A plastic knitting needle, though light in weight, is also poor in abrasion resistance and thus liable to local abrasion at its front or working end portion.

Metallic knitting needles currently available in the market include those of smaller diameters (lacing needles) which are made of steel wires and those of larger diameters which are made of aluminum wires in consideration of weight reduction. For increase in surface slipperiness, the steel knitting needle is usually plated with nickel, whereas the aluminum knitting needle is usually treated in surface to have sulphuric acid oxidation coating or chromic acid oxidation coating. However, as is well known in the field, such sulphuric acid oxidation coating and chromic oxidation coating are relatively poor in abrasion resistance to result in such disadvantage that when a front or working end portion of the needle comes into repetitive contact with a front end portion of a counterpart needle during a knitting operation, the coatings will be gradually abraded away to expose the inside aluminum core. This not only causes deterioration in surface slipperiness of the front end portion of the aluminum-made needle but also results in soiling of yarns due to contact thereof with the exposed aluminum core.

It is, therefore, an object of the present invention to provide a knitting needle which, while retaining the advantages of the conventional needle material, has excellent surface slipperiness and abrasion resistance at its working end portion.

According to the present invention, there is provided a knitting needle comprising a needle body, characterised in that the needle body includes a needle shank made of bamboo, wood, plastic or metal, and a separate front end member made of ceramic and fixed to one end of the needle shank in alignment therewith.

The invention will now be described further, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a side elevation showing a knitting needle, with an intermediate portion cut away, embodying the invention;

Figure 2 is a fragmentary elevation, with parts broken away for better clarity, showing an example of joint structure between a needle shank and a working end member in the knitting needle;

Figure 3 is a view similar to Figure 2 showing a modification of the joint structure;

Figure 4 is a view also similar to Figure 2 showing another modification of the joint structure; and

Figure 5 is a view again similar to Figure 2 showing a modified working end member.

Referring now to Figure 1, a knitting needle generally represented by reference numeral 10 is illustrated as havine one needle body which comprises a needle shank 2, a separate working end member 1 fixed to one end of the shank 2 in alignment therewith, and a stitch stopper 6 provided at the other end of the shank 2.

The shank 2 is circular in cross section and constant in diameter throughout the entire length thereof according to the illustrated example. The shank may be made of bamboo, wood, plastic or metal such as aluminum.

The stitch stopper 6 may be integral with the shank 2. Alternatively, the stopper may be a separate member which is attached to the shank. In the latter case, the stopper 6 may be made of the same material as the shank or of a different material such as synthetic resin rubber. The stopper serves to prevent loops of yarn from coming off the shank.

In accordance with the present invention, the working end member 1 is made of ceramic. According to the illustrated example, the working end member is generally conical to resemble a bullet with its larger diameter end connected to the shank 2.

In Figure 1, reference characters *A, B* and *C* indicate those parts which are most liable to abrasion in a knitting needle. Thus, the working end member 1 should advantageously have such a length that covers all of the parts *A, B* and *C* of the knitting needle 10 although a modified working end member (not shown) covering only the parts *A* and *B* can provide an intended effect to an acceptable extent.

The working end member 1 may be fixed to the shank 2 in various ways as described below.

In an example shown in Figure 2, the larger diameter end of the working end member 1 is formed with an integral axial projection surrounded by an annular end face 5a, whereas the adjacent end of the shank 2 is provided with a complementary axial bore 4 similarly surrounded by an annular end face 5b. The axial projection 3 is inserted into and adhesively bonded to the axial bore 4 with the opposing annular end

faces 5a, 5b adhesively bonded together to form a smoothly continuous connection between the working end member 1 and the shank 2.

In case the shank 2 is made of metal, the working end member 1 may be advantageously connected to the shank by brazing to ensure a stronger connection therebetween. In fact, such a brazing technique between ceramic and metal was recently developed.

According to a modification illustrated in Figure 3, the larger diameter end of the working end member 1 is formed with an internally threaded axial bore 24 surrounded by an annular end face 5a, while the adjacent end of the shank 2 is formed with an externally threaded axial projection 23 similarly surrounded by an annular end face 5b. Thus, a detachable connection is obtained between the working end member and the shank by screw engagement of the threaded projection 23 into the threaded bore 24 with the annular end faces 5a, 5b kept in intimate contact. Such a detachable connection enables ready replacement of the bullet-like end member 1 by a hooked working end member as illustrated in Figure 5 and as will be also described hereinbelow.

Figure 4 illustrates another modification in which the larger diameter end of the working end member 1 and the adjacent end of the shank 2 are respectively formed with similar axial bores 14a, 14b respectively surrounded by annular end faces 5a, 5b. A connection between the working end member and the shank is established by a connector rod 13 fitted in and adhesively bonded to both of the axial bores 14a, 14b with the annular end faces 5a, 5b adhesively bonded together.

The bullet-like working end member shown in each of Figures 1 to 4 may be replaced by a hooked working end member, as illustrated in Figure 5. More particularly, the working end member 1 in this particular example is also conical in general configuration but has a hook 1a at its smaller diameter end. The hooked working end member is illustrated as fixed to the shank 2 in a manner similar to the example of Figure 3.

According to the present invention, the working end member 1 made of ceramic is excellent in surface slipperiness and abrasion resistance, so that the knitting needle 10 ensures ready knitting free of unexpected unravelling of yarn and provides prolonged use. Further, employment of bamboo, wood or plastic as a material for the needle shank 2 contributes to an overall weight reduction without inviting the disadvantages inherent to these materials since the working end member 1 itself is made of ceramic. The present invention is also significant in that it enables the use, as a material for the shank 2, of wood which has been hitherto considered unapplicable to knitting needles because of its excessive softness.

The invention thus being described, it will be obvious that the same may be modified in various ways in addition to the previously described modifications. For instance, the stitch stopper 6 illustrated in Figure 1 may be replaced by a second working end member which is also made of ceramic. Alternatively, a non-working or rear end of the needle shank 2 may be connected to one end of a flexible cord on which is mounted a stitch stopper. Further, the other end of such a flexible cord may be connected to a second needle body which similarly comprises a needle shank and a separate working end member, thus providing a so-called circular knitting needle.

CLAIMS

1. A knitting needle comprising a needle body, characterised in that said needle body includes a needle shank made of bamboo, wood, plastic or metal, and a separate working end member made of ceramic and fixed to one end of said needle shank in alignment therewith.

2. A needle according to claim 1, wherein said end member is generally conical in shape with its larger diameter end fixed to said one end of said shank.

3. A needle according to claim 1, wherein said end member is integrally formed with a hook.

4. A needle according to claim 2 or 3, wherein said one end of said shank is formed with an axial bore surrounded by an annular end face, and said larger diameter end of said end member is integrally formed with an axial projection surrounded by an annular end face, said projection being closely inserted into said bore with bore of said annular end faces kept in contact with each other.

5. A needle according to claim 2 or 3, wherein said one end of said shank is integrally formed with an axial projection surrounded by an annular end face, and said larger diameter end of said end member is formed with an axial bore surrounded by an annular end face, said projection being closely inserted into said bore with both of annular end faces kept in contact with each other.

6. A needle according to claim 4 or 5, wherein said projection and said bore as well as said annular end faces are adhesively bonded together.

7. A needle according to claim 4 or 5, wherein said projection is externally threaded for removable screw engagement into said bore which is internally threaded.

8. A needle according to claim 2 or 3, wherein said one end of said shank is formed with an axial bore surrounded by an annular end face, and said larger diameter end of said end member is also formed with an axial bore surrounded by an annular end face, a connector rod being inserted into and adhesively bonded to both of said bores with both of said annular end faces kept in contact with and adhesively bonded to each other.

9. A knitting needle substantially as herein described with reference to any of Figures 1 to 5 of the accompanying drawings.

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